



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/520,411	01/06/2005	Atsushi Oohashi	Q85261	5492
23373	7590	03/23/2006	EXAMINER	
SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			NGUYEN, TRAN N	
			ART UNIT	PAPER NUMBER
			2834	

DATE MAILED: 03/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

2/

Office Action Summary	Application No. 10/520,411	Applicant(s) OOHASHI ET AL.	
	Examiner Tran N. Nguyen	Art Unit 2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 20 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
 4a) Of the above claim(s) 8-13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Restriction/Election Requirement

Restriction to one of the following inventions is required under 35 U.S.C. 121:

(I) **Claims 1-7** are drawn to a structure of a stator **class 310, subclass 254**.

(I) Claims 8-13 are drawn to method of making an armature in a motor, classified in class 29, subclass 596.

The applicant elected claims 1-7 on 1/20/06 without traverse. Therefore, the Restriction is hereby made FINAL.

Information Disclosure Statement

The information disclosure statement filed 1/6/05 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

Claim Rejections - 35 USC § 112

1. Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Among claims 1-7, the term “racetrack-shaped cross section” is indefinite because it is unclear what is the “racetrack shape”, e.g. a racetrack may be flat or curved or even hilly. In light of the spec, the term “racetrack-shaped cross section” is understood as rectangular-shaped cross section”.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

- 2. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Asao et al (US 6049154) in view of Kurihashi et al (JP 63-194543).**

Asao discloses a dynamoelectric stator comprising: a cylindrical stator core (2), in which slots (2b) are arranged in a circumferential direction so as to open onto an inner circumferential side; and a stator winding mounted to said stator core, characterized in that said stator winding comprises a plurality of slot-housed portions housed in each of said slots; and coil end portions linking together end portions of said slot-housed portions that are housed in pairs of said slots separated by a predetermined number of slots (fig 1). Asao substantially discloses the claimed invention, except for the limitations of the following:

the winding comprises a plurality of slot-housed portions housed in each of said slots; and coil end portions linking together end portions of said slot-housed portions that are housed in pairs of said slots separated by a predetermined number of slots, wherein said slot-housed portions are formed with a rectangular-shaped cross section, and are housed so as to line up in at least one column in a radial direction with a longitudinal direction of said cross section aligned in a circumferential direction so as to be in close contact with each other, wherein the winding's slot housed portions line up in single column in radial direction and the ratio of the $L_{sub.2}/L_{sub.1}$ that is greater than or equal to forty-five percent and less than or equal to seventy percent where $L_{sub.1}$ is a length of a long side of said rectangular-shaped cross section and $L_{sub.2}$ is a length of a short side.

Kurihashi, for the purpose of improve space factor in the slot for increasing winding density, discloses a dynamoelectric stator comprising: a cylindrical stator core (1), in which slots (3) are arranged in a circumferential direction so as to open onto an inner circumferential side; and a stator winding (4) mounted to said stator core, characterized in that said stator winding comprises a plurality of slot-housed portions (4) housed in each of said slots (figs 5, 7); and coil end portions (4a) linking together end portions of said slot-housed portions that are housed in pairs of said slots separated by a predetermined number of slots, wherein said slot-housed portions are formed with a rectangular-shaped cross section, and are housed so as to line up in at least one column in a radial direction with a longitudinal direction of said cross section aligned in a circumferential direction so as to be in close contact with each other, and wherein the winding's slot housed portions line up in single column in radial direction (figs 5-7).

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the Asao's winding by configuring the winding so that winding comprises a plurality of slot-housed portions housed in each of said slots; and coil end portions linking together end portions of said slot-housed portions that are housed in pairs of said slots separated by a predetermined number of slots, wherein said slot-housed portions are formed with a rectangular-shaped cross section, and are housed so as to line up in at least one column in a radial direction with a longitudinal direction of said cross section aligned in a circumferential direction so as to be in close contact with each other, wherein the winding's slot housed portions line up in single column in radial direction, as taught by Kurihashi. Doing so would improve the space factor for the winding, particularly the winding's slot housed portions in order to increase the winding density for the stator.

*Regarding the ratio of the $L_{sub.2}/L_{sub.1}$ that is greater than or equal to forty-five percent and less than or equal to seventy percent where $L_{sub.1}$ is a length of a long side of said rectangular-shaped cross section and $L_{sub.2}$ is a length of a short side, **Kurihashi** discloses the*

Art Unit: 2834

winding's slot housed portions having a rectangular cross-sectional shape. Those skilled in the art would understand that it would have been obvious to an artisan to change the size/shape of the winding's slot housed portions so that the ratio of the length and the width of the rectangular-cross section would be within the workable optimum range in order to further enhance the space factor for the winding's slot housed portions.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the winding with rectangular-cross-sectional slot housed portions, as disclosed by Kurihashi, by changing size/shape of winding slot housed portion's the rectangular cross section so that the ratio of the of the length and the width of the rectangular-cross section would be within the workable optimum range of greater than or equal to 40% and less than or equal to 70%. Doing so would further enhance the space factor of the winding's slot housed portions. Furthermore, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In *re* Aller, 105 USPQ 233 and a change in size or shape is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955) (emphasis added).

3. **Claims 5-6** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Asao and Kurihashi**, as applied in the rejection against the base claim, and further in view of **Kneisley et al (US 5,166,567)**

The combination of Asao and Kurihashi refs substantially discloses the claimed invention, except for the added limitations *of slots are formed into a substantially trapezoidal shape tapering radially inward; and aspect ratios of said cross sections of said slot-housed portions housed so as to line up inside said slots in a radial direction are formed so as to increase gradually radially inward so as to match said substantially trapezoidal shape of said slots.*

Kneisley, for the purpose of reducing magnetic leakage therein, teaches a stator (figs 5-6) with slots being formed into a substantially trapezoidal shape tapering radially inward (figs 5-6). Those skilled in the art would understand that in order for the winding's slot housed portions fit properly within the trapezoidal accommodating space of the slot, it would have been obvious to an artisan to configure the winding slot housed portions so that the aspect ratios of said cross sections of said slot-housed portions housed so as to line up inside said slots in a radial direction are formed so as to increase gradually radially inward so as to match said substantially trapezoidal shape of said slots.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the stator slot with a trapezoidal configuration, as taught by **Kneisley**, for the purpose of reducing magnetic flux leakage therein, and the winding slot housed portions so that the aspect ratios of said cross sections of said slot-housed portions housed so as to line up inside said slots in a radial direction are formed so as to increase gradually radially inward so as to match said substantially trapezoidal shape of said slots for the purpose of enhancing proper fit of the winding's slot housed portions within the trapezoidal accommodating space of the slot. Doing so would improve the efficiency of the stator by reducing magnetic leakage flux while provide sufficient winding density thereof.

*Regarding claim 6 reciting the ratio of the $L_{sub.2}/L_{sub.1}$ that is greater than or equal to forty-five percent and less than or equal to seventy percent where $L_{sub.1}$ is a length of a long side of said rectangular-shaped cross section and $L_{sub.2}$ is a length of a short side, **Kurihashi** discloses the winding's slot housed portions having a rectangular cross-sectional shape. Those skilled in the art would understand that it would have been obvious to an artisan to change the size/shape of the winding's slot housed portions so that the ratio of the length and the width of the rectangular-cross section would be within the workable optimum range in order to further enhance the space factor for the winding's slot housed portions.*

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the winding with rectangular-cross-sectional slot housed portions, as disclosed by Kurihashi, by changing size/shape of winding slot housed portion's the rectangular cross section so that the ratio of the of the length and the width of the rectangular-cross section would be within the workable optimum range of greater than or equal to 40% and less than or equal to 70%. Doing so would further enhance the space factor of the winding's slot housed portions. Furthermore, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In *re* Aller, 105 USPQ 233 and a change in size or shape is generally recognized as being within the level of ordinary skill in the art. *In re* Rose, 105 USPQ 237 (CCPA 1955) (emphasis added).

4. **Claim 7** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Asao** and **Kurihashi**, as applied in the rejection against the base claim, and further in view of **Larsh** (US 3028266)

The combination of Asao and Kurihashi refs substantially discloses the claimed invention, except for the added limitations *of slots are impregnated with a varnish*.

Larsh, however, teaches the stator's slots are applied with an impregnated varnish layer for the purpose of enhancing bonding between the slot and the slot's insulating liner as well as insulating and securing the winding therein.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the stator by providing the slots with impregnated varnish, as taught by Larsh. Doing so would provide means for enhancing bonding between the slot and the slot's insulating liner as well as insulating and securing the winding therein.

Double Patenting

The non-statutory double patenting rejection, whether of the obviousness-type or non-obviousness-type, is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent. *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); and *In re Goodman*, 29 USPQ2d 2010 (Fed. Cir. 1993).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(b) and © may be used to overcome an actual or provisional rejection based on a non-statutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.78(d).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-7 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over **claims 1-8 of U.S. Patent 6,960,857** (hereafter, USP '857) in view of **Kurihashi, and Larsh**.

Claims 1-7 of USP'857 are similar to claims 1-8 of this application as follow:

A stator comprising: an annular (cylindrical) core back portion, with plural of slots; and stator winding composed of a plurality of winding phase portions each installed in said stator core in a slot group constituted by a group of said slots disposed at intervals of a predetermined number of slots, wherein the winding's slot-housed portions is formed with a flat cross section (i.e., rectangular cross section) and said slot-opening passing portions having a width which is narrower than a width of the slot-housed portions, and said slot-housed portions are housed inside each of said slots in a plurality of layers so as to be arranged in at least a single row in a

Art Unit: 2834

radial direction, wherein: said slots are formed into a substantially trapezoidal shape tapering radially inward, and said slot-housed portions arranged inside said slots in a radial direction are formed such that the flatness ratio of each slot-housed portion decreases sequentially from an outer radial side to an inner radial side so as to conform said slot-housed portions to said substantially trapezoidal shape of said slots.

The only differences between the patented invention and the present application's claimed invention are as the following recitation in the claimed invention are the following:

(a) the winding comprises a plurality of slot-housed portions housed in each of said slots; and coil end portions linking together end portions of said slot-housed portions that are housed in pairs of said slots separated by a predetermined number of slots, wherein said slot-housed portions are formed with a rectangular-shaped cross section, and are housed so as to line up in at least one column in a radial direction with a longitudinal direction of said cross section aligned in a circumferential direction so as to be in close contact with each other, wherein the winding's slot housed portions line up in single column in radial direction and the ratio of the $L_{sub.2}/L_{sub.1}$ that is greater than or equal to forty-five percent and less than or equal to seventy percent where $L_{sub.1}$ is a length of a long side of said rectangular-shaped cross section and $L_{sub.2}$ is a length of a short side;

(b) slots are impregnated with a varnish.

Regarding subsection (a) herein, **Kurihashi**, for the purpose of improve space factor in the slot for increasing winding density, discloses a dynamoelectric stator comprising: a cylindrical stator core (1), in which slots (3) are arranged in a circumferential direction so as to open onto an inner circumferential side; and a stator winding (4) mounted to said stator core, characterized in that said stator winding comprises a plurality of slot-housed portions (4) housed in each of said slots (figs 5, 7); and coil end portions (4a) linking together end portions of said slot-housed portions that are housed in pairs of said slots separated by a predetermined number of slots, wherein said slot-housed portions are formed with a rectangular-shaped cross section, and are

housed so as to line up in at least one column in a radial direction with a longitudinal direction of said cross section aligned in a circumferential direction so as to be in close contact with each other, and wherein the winding's slot housed portions line up in single column in radial direction (figs 5-7).

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the Asao's winding by configuring the winding so that winding comprises a plurality of slot-housed portions housed in each of said slots; and coil end portions linking together end portions of said slot-housed portions that are housed in pairs of said slots separated by a predetermined number of slots, wherein said slot-housed portions are formed with a rectangular-shaped cross section, and are housed so as to line up in at least one column in a radial direction with a longitudinal direction of said cross section aligned in a circumferential direction so as to be in close contact with each other, wherein the winding's slot housed portions line up in single column in radial direction, as taught by Kurihashi. Doing so would improve the space factor for the winding, particularly the winding's slot housed portions in order to increase the winding density for the stator.

Regarding the ratio of the $L_{sub.2}/L_{sub.1}$ that is greater than or equal to forty-five percent and less than or equal to seventy percent where $L_{sub.1}$ is a length of a long side of said rectangular-shaped cross section and $L_{sub.2}$ is a length of a short side, Kurihashi discloses the winding's slot housed portions having a rectangular cross-sectional shape. Those skilled in the art would understand that it would have been obvious to an artisan to change the size/shape of the winding's slot housed portions so that the ratio of the length and the width of the rectangular-cross section would be within the workable optimum range in order to further enhance the space factor for the winding's slot housed portions.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the winding with rectangular-cross-sectional slot housed portions, as disclosed

Art Unit: 2834

by Kurihashi, by changing size/shape of winding slot housed portion's the rectangular cross section so that the ratio of the of the length and the width of the rectangular-cross section would be within the workable optimum range of greater than or equal to 40% and less than or equal to 70%. Doing so would further enhance the space factor of the winding's slot housed portions. Furthermore, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In *re* Aller, 105 USPQ 233 and a change in size or shape is generally recognized as being within the level of ordinary skill in the art. *In re* Rose, 105 USPQ 237 (CCPA 1955) (emphasis added).

Regarding subsection (b) herein, Larsh teaches the stator's slots are applied with an impregnated varnish layer for the purpose of enhancing bonding between the slot and the slot's insulating liner as well as insulating and securing the winding therein.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the stator by providing the slots with impregnated varnish, as taught by Larsh. Doing so would provide means for enhancing bonding between the slot and the slot's insulating liner as well as insulating and securing the winding therein.

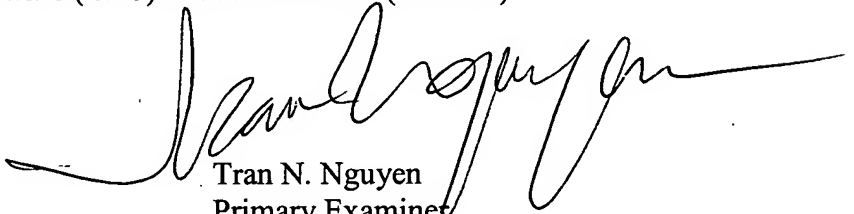
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tran N. Nguyen whose telephone number is (571) 272-2030. The examiner can normally be reached on M-F 7:00AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on (571)-272-2044. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2834

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Tran N. Nguyen
Primary Examiner
Art Unit 2834